# EXHIBIT 2

Date: May 26, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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CIZION, LLC d/b/a VULCAN INDUSTRIAL MANUFACTURING,
Petitioner

v.

KERR MACHINE CO.,
Patent Owner

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Case PGR2020-00065
Patent 10,591,070

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**PETITION FOR POST-GRANT REVIEW OF U.S. PATENT NO. 10,591,070 UNDER 35 U.S.C. §§ 321-329 AND 37 C.F.R. § 42.200 ET SEQ.**

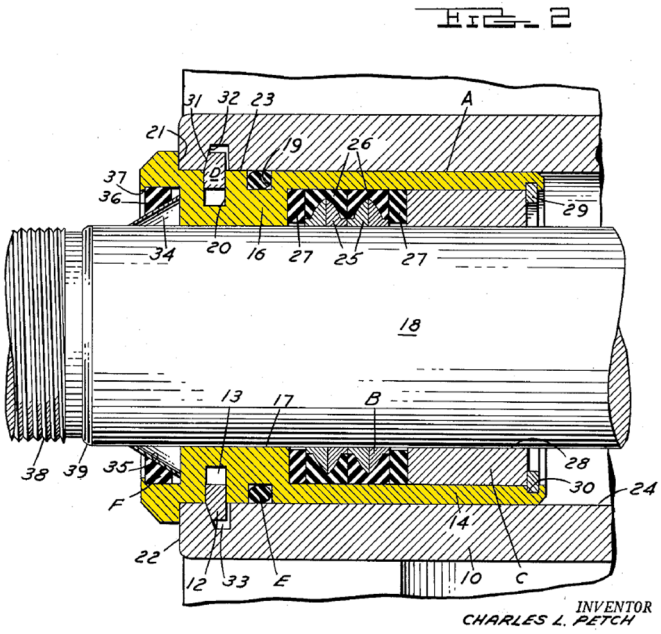
(citing Ex. 1042 at 4 (defining "brake horsepower" and "output power" as "[t]he power of an engine as measured by a brake dynamometer")). Thus, in light of the specification and claim language, a POSITA would have understood that the term "horsepower" means "horsepower/ brake horsepower." Ex. 1012 ¶¶108-109.

## VI. THE PRIOR ART

### A. State of the Art

All purported points of novelty of the '070 Patent were known in the art well before September 2015—the earliest possible alleged priority date of the '070 Patent.[4]

First, stuffing box sleeves have been used in fluid ends for decades, including as shown in yellow in U.S. Patent No. 2,713, 522 (July 19, 1955).




[4] *See supra* n.2.

Ex. 1029, Fig. 2 (annotated); Ex. 1012 ¶¶42-43.

Second, grooves and seals have been placed in interior walls of fluid flow devices before September 2015, including as shown in U.S. Patent Nos. 8,528,585 (Sep. 10, 2013) and 7,828,053 (Nov. 9, 2010) to McGuire et al. Ex. 1012 ¶¶44-47.

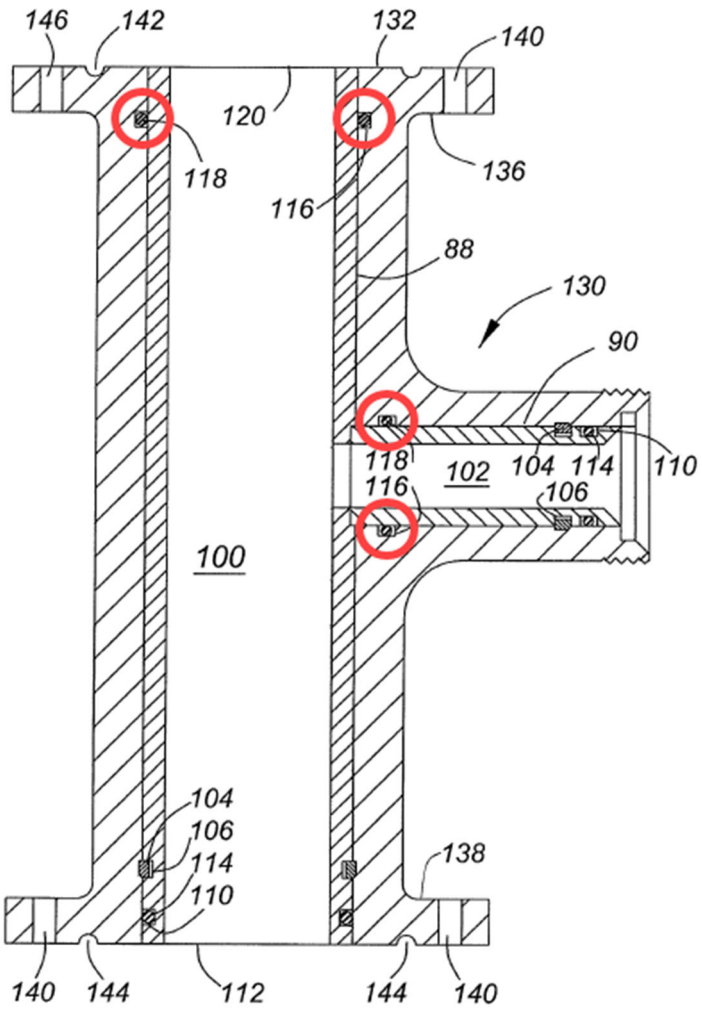



FIG. 6

Ex. 1024, Fig. 6 (annotated).

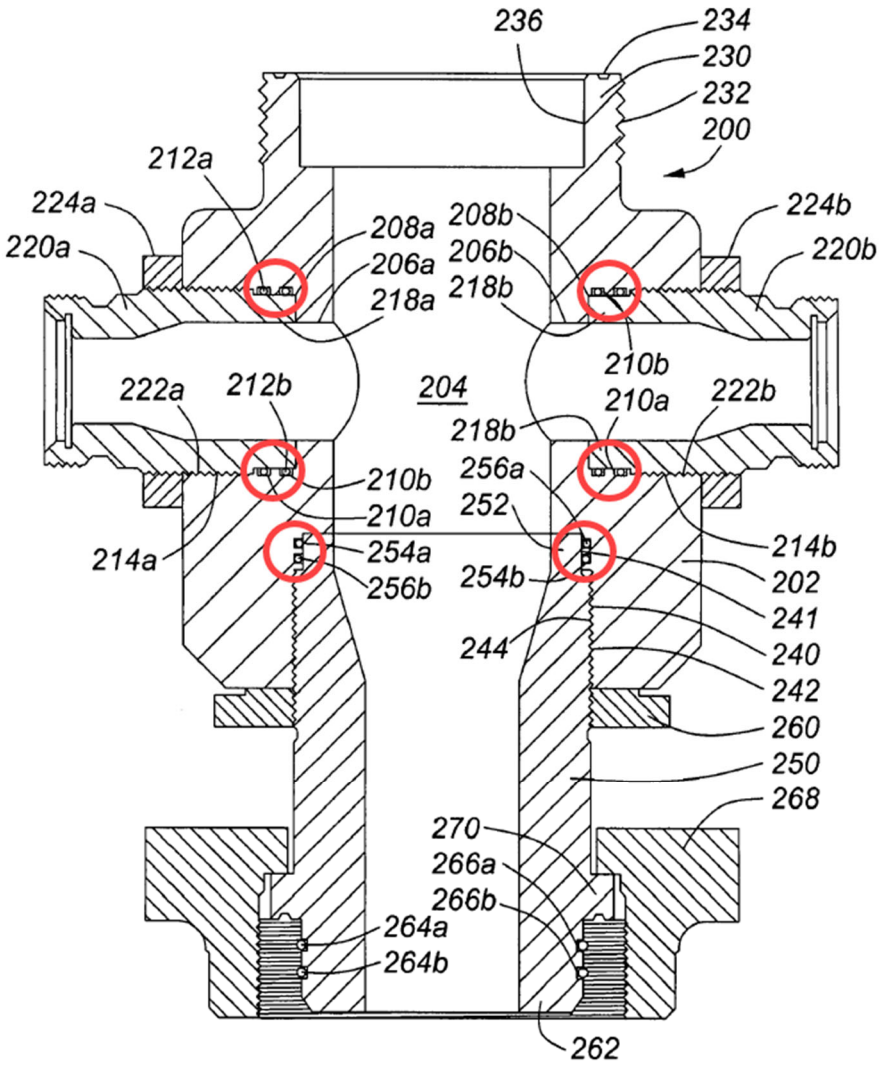
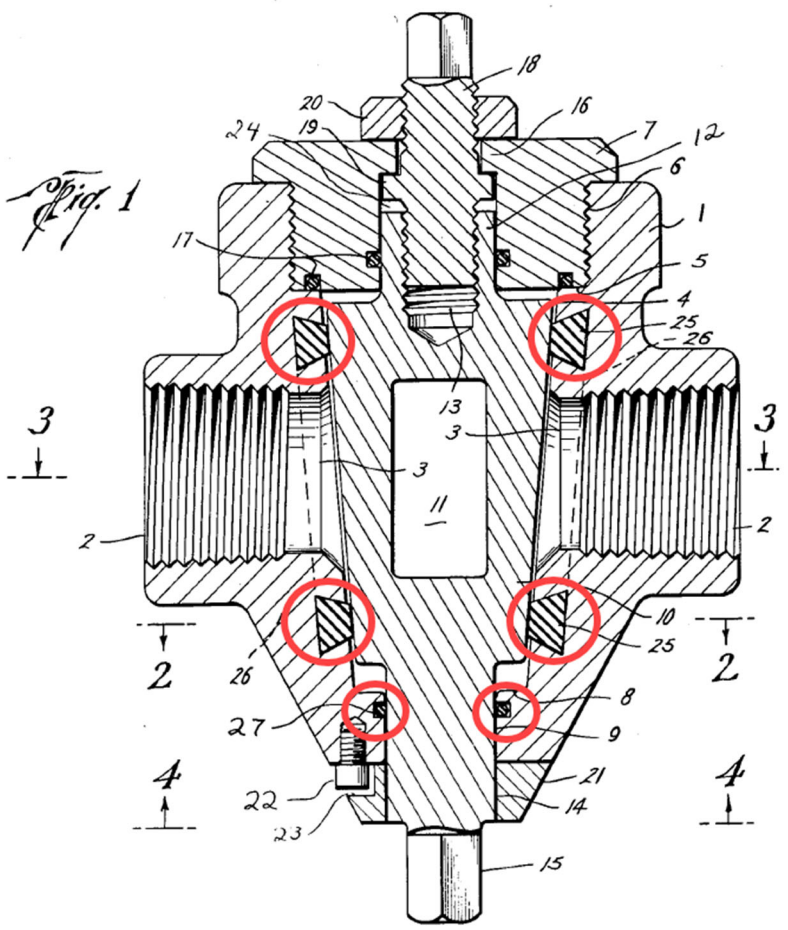



**FIG. 2**

Ex. 1025, Fig. 2 (annotated). Such groove and seal placement has been used for decades, as shown in U.S. Patent No. 2,756,960 (Jul. 31, 1956). Ex. 1012 ¶49; *see also id.* ¶48-50.




Ex. 1028, Fig. 1 (annotated), 1:60-62 ("Suitable sealing means, such as a groove and O-ring 27 may be provided in the inside of the orifice 9 as an auxiliary sealing means."), 2:10-11; Ex. 1012 ¶49.

Third, contrary to the declarations Kerr submitted during prosecution of an earlier application (*supra* Part V.B), techniques for machining grooves in the interior walls of fluid flow devices were well known in the art before September 2015. Ex. 1012 ¶¶51-56 (describing groove milling tools which a POSITA would have appreciated could have been used to mill interior grooves in fluid ends).

Fourth, a POSITA, prior to September 2015, would have understood that the wear and erosion caused to fluid flow device housings by abrasive materials in the fluid could be mitigated by sacrificial sleeves, and that oftentimes, the packing and seals damaged by such abrasive materials would also cause wear and erosion of adjacent housings. Ex. 1012 ¶¶57-64.

**B. Blume '097 (Ex. 1003)**

Blume '097 discloses a fluid end assembly with a circumferential seal groove in the housing, and an elastomeric seal within the seal groove. Ex. 1003, Fig. 12B. Figure 12B further shows a packing cartridge housing (sleeve, yellow) that engages with the elastomeric seal in the housing and that has two "component rings" (blue) disposed therein. *Id.* The annotated figures below overlay Figure 12B onto Figure 13 per the disclosure that the cartridge packing assembly of Figure 12B can be installed in plunger pump housing 50.

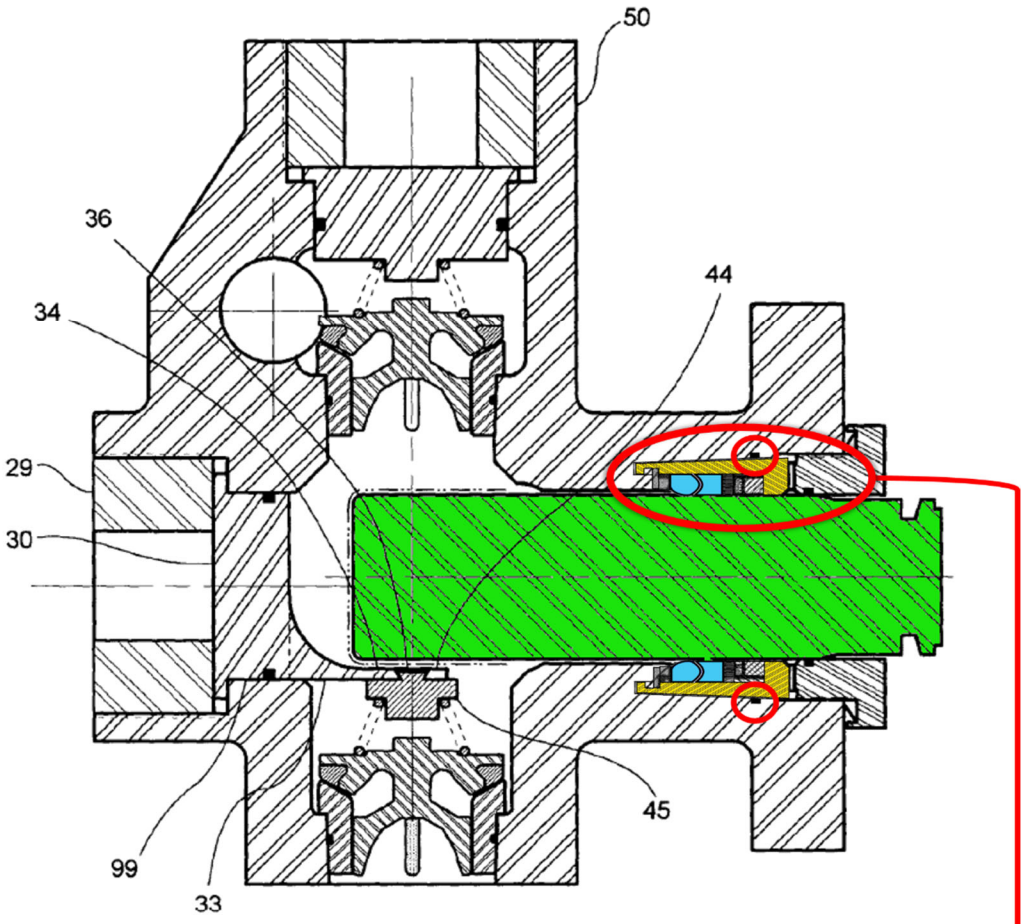



Figure 13

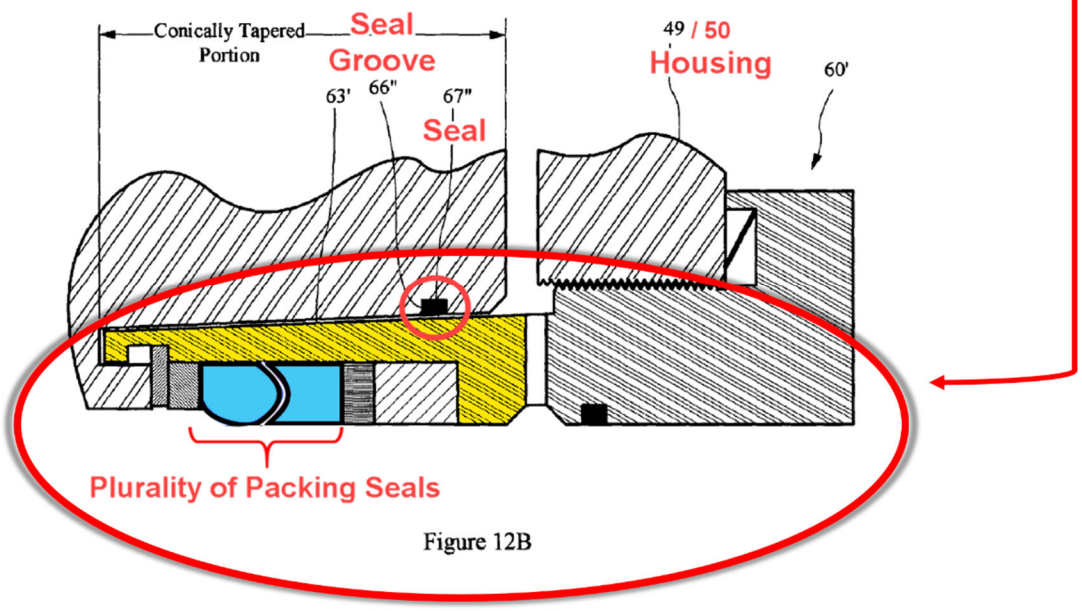



Figure 12B

*Id.* at Fig. 13 overlay (overlaying Fig. 12B onto Fig. 13, per *id.* at 10:66-11:2); Ex. 1012 ¶110.

### C. Blume ’012 (Ex. 1004)

Blume ’012 discloses a fluid end assembly with the same groove, seal, and sleeve arrangement as Blume ’097. The annotated figures below overlay Figure 12B onto Figure 10A per the disclosure that the cartridge packing assembly of Figure 12B can be “installed in Y-block plunger pump housings of the present invention.” Ex. 1004 at 10:10-13.

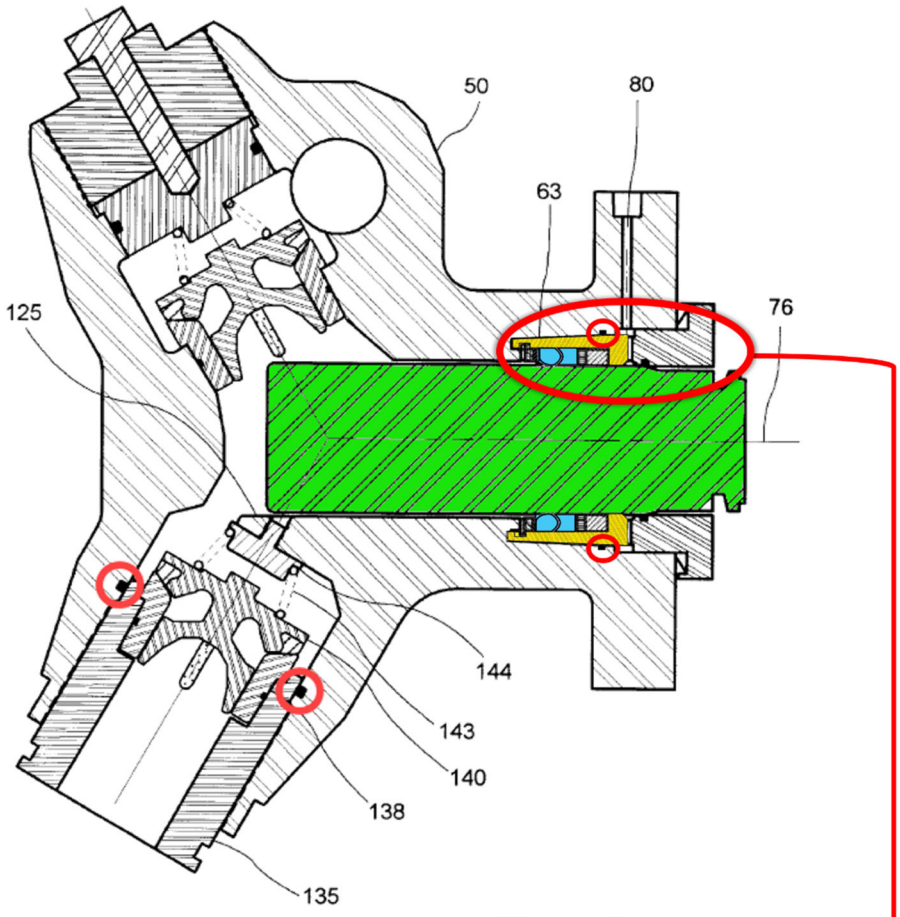



Figure 10A

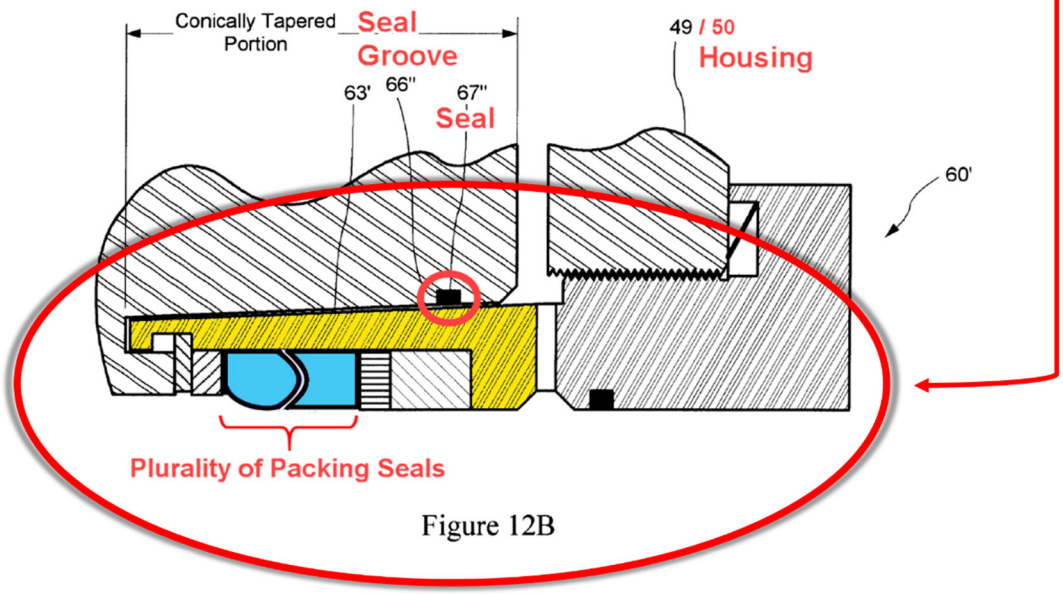



Figure 12B

Ex. 1004, Fig. 10A overlay (overlaying Fig. 12B onto Fig. 10A, per *id.* at 4:33-37, 4:62-65, 10:10-21). As annotated above, Blume '012 also discloses an additional annular channel in the housing of the first conduit. *Id.* Fig. 10A; *see also id.* Fig. 9A. Ex. 1012 ¶111.

**D. Whaley (Ex. 1005)**

Whaley discloses a pump fluid end with a near-identical sleeve, seal, and housing arrangement to that of the '070 Patent. A packing housing (tubular sleeve, yellow) has a set of seals (blue) disposed therein, and is engaged with a seal in an annular channel in the housing of the pump (red circle):

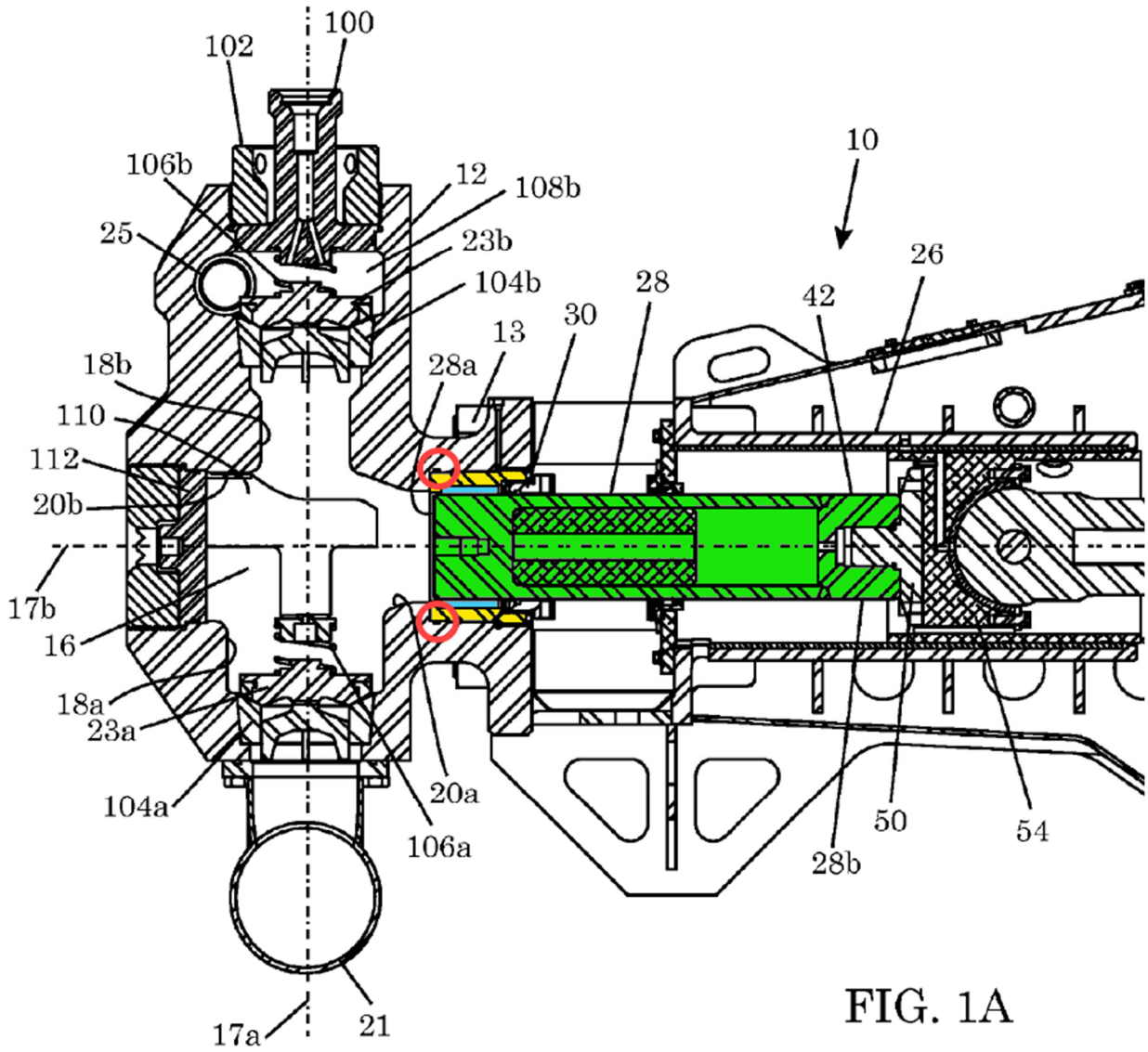



FIG. 1A

Ex. 1005, Fig. 1A (annotated and cropped).